

N. H., N. Y., Dak.; 17th, Me., Md., Ky., N. C.; 18th, Md., Dak.; 19th, Ill., Ind., Me., Mich., N. Y., Ohio, Ky.; 20th, Neb., Ill., Iowa, Me., Ohio, Tenn., Wis., Dak., Ga.; 21st, Neb., N. J., Ohio, Col.; 22nd, Iowa, Kan.; 23rd, Cal., Kan.; 24th, Ohio; 25th, Conn., Ind. Ty., Tex., R. I.; 26th, Col., Kan., Tex., Ga.; 27th, Mo., N. C., Ga.; 28th, Conn., Iowa, Mass., Neb., N. Y., Kan., Ga., R. I.

*Lunar Halos*.—1st, Mich.; 2nd, Mass., Neb.; 3rd, Mich.; 4th, Neb.; 6th, Ark., Me., N. H.; 7th, Can., Ill., Iowa, Md., Mich., N. J., Va., Wis., Neb., Mo., N. Y., Ky., Conn.; 8th, Ind., Minn., N. J., Wis., Tex., Mich., Vt., Mass.; 9th, Dak., Iowa, Mass., Mich., Minn., Neb., N. J., Pa., Wis., Cal., Kan., N. C., Ga., S. C.; 10th, Neb., Ill., Iowa, Mo., Ohio, Wis., N. M., Mass.; 11th, Ill., Ind., Md., Mass., Mo., Neb., N. H., N. Y., N. C., Ohio, Pa., Vt., Wis., Dak., Tex., Iowa, Mich., Tenn., R. I., Me., Conn.; 12th, Neb., Conn., Ill., Iowa, Kan., Ky., Me., Mass., N. H., N. Y., N. C., Wis., Nev., Col., Miss., Ala., Minn., Ohio, Tenn., Fla., Ga., S. C., Me., R. I.; 13th, Ind., Iowa, Kan., N. J., N. Y., Ohio, Pa., Vt., Wis., Cal., Col., Minn., Ill., Mich., Ky., Mass., Conn.; 14th, Mich., Conn., Ind., Iowa, Miss., N. J., N. Y., Ohio, Vt., Va., Wis.; 15th, Can.; Conn., Ind., Me., Mass., Neb., N. J., N. Y., Tex., Mich., N. C., N. H., R. I., Vt.; 16th, Dak., Ill., Ind., Kan., Ky., Me., Mass., Mich., Miss., Mo., N. H., N. J., N. Y., N. C., Ohio, Vt., Cal., Neb., Ala., Minn., Tenn., Va., Me., R. I., Conn.; 17th, Ill., Mass., Cal., Neb., Mo., Conn.; 18th, Ill., Iowa, Kan., Miss., Ala., La., N. Y., N. H., Mass.; 19th, Ill., Ind., Mass., Va., Ga., Conn.; 20th, Me., Nev., Mass.; 21st, S. C., 23rd, Cal.

*Mirage*.—Olivet, Dak.; 4th, Baxter Springs, Kan.; 28th, Moorhead, Minn., 1st and 2d; Genou, Neb., 4th, Tybee Island, Ga., 11th, New London, 3d and 19th.

## MISCELLANEOUS PHENOMENA.

**BOTANICAL**.—Alabama—Green Spring, peach trees in bloom, 23rd. Arkansas—Judsonia, spring beauties, maples and daffodils blooming, 17th; wild forget-me-nots and peach trees in bloom, 22nd. California—Visalia, peach trees in full bloom, 22nd; Sacramento, almond and peach trees in bloom several weeks: trees leafing. Connecticut—New London, crocus blooming, 25th. Dakota—Olivet, weeds and grass sprouting, 28th. Florida—Houston, peach trees and rose bushes in bloom, 12th, crocuses and hyacinths in bloom 28th; plum trees in bloom, 24th; Milton, plum trees in bloom, 28th; peach trees in bloom, 24th. Illinois—Havana, scilla siberica blooming, 25th; soft maples in bloom, 20th. Iowa—Fort Madison, peonies, horse radish and calamus sprouting, 7th; elder trees budding, cherry and peach buds swelling, and blackberry buds bursting, 17th. Kansas—Cresswell, peach buds swelling 23rd, wheat growing finely; 25th Empire City, snowdrop and crocus in bloom 12th, liverwort in bloom 13th; Independence, Addertongue in bloom 25th, willow leafing 22nd, soft maple blooming 27th, peaches, cherries and plums nearly in bloom 28th, wheat growing the entire month Baxter Springs, roses and honey suckles leafing 27th; Holton, forest trees budding 28th; Lawrence, maples in bloom 16th. Mississippi, Brookhaven, maple trees and jessamine blooming, hickory buds swelling 24th; Vicksburg, peach trees blooming 24th. Michigan, Litchfield, maple sap running 28th. Louisiana, New Orleans, orange trees budding 27th. Missouri—Lebanon, cherries budding, peach buds fully formed, 28th. Oregon, maple trees budding, 6th. New Hampshire—Mill Village, maple sap running well, 28th. New Jersey—Vineland, cottonwood and maple buds swelling, 9th. Ohio—Ruggles, wheat green, maple-trees budding, 28th; Ringgold, wheat and fruit prospects good, 28th. Pennsylvania—Chambersburg, crocus and snow-drops in bloom, 21st. Tennessee—McMinnville, forest trees budding, iris and spirea blooming, 23d. Maryland—New Market, purple grackle first seen, 27th. Sandy Springs, wheat growing, flowers in bloom, 28th. Texas—Clarksville, peach and plum trees in bloom; Belmont Farm, wild flowers in bloom, 17th, peach and almond trees in bloom, 19th; Austin, garden vegetables abundant, flowers in bloom, all fruit trees in bloom, 28th; Graham, prairie violets in bloom, 17th. Virginia—Alto Vista, elder bushes budding, 22d; Prospect Hill, daffodils in bloom, 22d, hyacinths in bloom, 14th; Wytheville, aspens budding, 8th, pruning and transplanting, 28th. West Virginia—Morgantown, trees budding, 24th. Wisconsin—Rocky Run, willows budding, 4th.

**BIRDS**.—Blackbirds, Southington, Conn., 28th; Elmira, Ill., 23rd; Great Bend, Kan., 28th; Fallston, Md., 23rd; Mendon, Mass., 28th; Fayette, Miss., 1st, 7th; Bethel, Ohio, 24th. Bullfinches, Oregon, Mo., 26th. Bluebirds, Judsonia, Ark., 6th; Southington, Conn., 2nd, 5th, 8th, 12th, 22nd, 24th to 28th; Elmira, Ill., 25th; Hennepin, Ill., 27th; Sandwich, Ill., 28th; Havana, Ill., 3rd; Louisville, Ill., 17th; Fort Madison, Iowa, 20th; Guttenburg, Iowa, 27th; Empire City, Kan., 13th; Independence, Kan., 28th; Afton, Iowa, 25th; Muscatine, Iowa, 25th; Boonsboro, Iowa, 27th; Stanley, Kan., 17th; Holton, Kan., 17th; Mendon, Mass., 28th; Fort Gibson, Ind. Ty., 19th; Davenport, Iowa, 20th; Somerset, Mass., 24th; Fall River, Mass., 23rd; Northport, Mich., 28th; Litchfield, Mich., 25th; Oregon, Mo., 5th; Plattsmouth, Neb., 15th; Starky, N. Y., 25th; Flushing, N. Y., 17th; Murphy, N. C., 10th; Highlands, N. C., 7th; Bellefontaine, Ohio, 24th; Little Mountain, Ohio, 22nd; Bethel, Ohio, 13th; Jacksonburg, Ohio, 15th; Mt. Auburn, Ohio, 24th; Robins, Elmira, N. Y., 22nd; Sandwich, Ill., 21st; Havana, Ill., 3rd; Milford, Ind., 24th; Fort Madison, Iowa, 20th; Empire City, Kan., 15th; Independence, Kan., 28th; Boonsboro, Iowa, 27th; Holton, Kan., 19th; Fort Gibson, Ind. Ty., 14th; Somerset, Mass., 19th; Fall River, Mass., 28th; Litchfield, Mich., 1st; Oregon, Mo., 19th; Freehold, N. J., 8th and 23rd; Starky, N. Y., 28th; Bellefontaine, Ohio, 19th; Little Mountain, Ohio, 22nd; Bethel, Ohio, 13th; Jacksonburg, Ohio, 21st; Mt. Auburn, Ohio, 7th; Ringgold, Ohio, 21st; Brownsville, Pa., 21st; Lynchburg, Va., 28th. Ducks, Judsonia, Ark., 5th and 6th; Olivet, Dak., 20th; Elmira, Ill., 25th; Milford, Ind., 22nd; Guttenburg, Iowa, 18th; Cresswell, Kan.,

3rd, 11th, 14th, 23rd; Muscatine, Iowa, 25th; Vail, Iowa, 19th; Great Bend, Kan., 6th; Dubuque, 20th; Oregon, Mo., 7th, 18th and 18th; Emerson, Nebraska, 20th; Jacksonburg, Ohio, 18th. *Crows*, Monticello, Iowa, 5th; Bethel, Ohio, 13; Ringgold, Ohio, 9th. *Killdeer*, Ft. Madison, Iowa, 19th; Milford, Del., 22nd; Baxter Springs, Kan., 16th; Fallston, Md., 23rd. *Pigeons*, Fayette, Miss., 12th; Jacksonburg, Ohio, 18th. *Phoebe birds*, Plattsmouth, Neb., 23rd; Somerset, Mass., 8th. *Buzzards*, Jacksonburgh, Ohio, 25th. *Geese*, flying N., Sandwich, Ill., 23rd; Elmira, Ill., 25th; Augusta, Ill., 17th; Mt. Sterling, Ill., 28th; Laconia, Ind., 9th; Milford, Ind., 22nd; Monticello, Iowa, 19th; Guttenburg, Iowa, 19th; Creswell, Kan., 16th; Independence, Kan., 27th; Vail, Iowa, 18th; Nora Springs, Iowa, 19th; Visalia, Cal., 21st; Fort Gibson, Ind. Ty., 14th; Dubuque, 28th; Emerson, Neb., 20th; Flushing, N. Y., 10th; flying W., Mt. Sterling, Ill., 16th; flying S., Fort Madison, Iowa, 7th; Centre Mound, Kan., 21st; Somerset, Mass., 19th; flying N.E., Fort Madison, Iowa, 2nd; Holton, Kan., 13th; N.W., Los Angeles, Cal., 6th. *Meadow Larks*—Hennepin, Ill., 27th; Nora Springs, Iowa, 14th; Centre Mound, Kan., 28th; Great Bend, Kan., 28th; Bellefontaine, Ohio, 24th. *Chickadee*—Monticello, Iowa, 3rd and 10th. *Woodpeckers*—Monticello, Iowa, 4th. *English Sparrows*—New Market, Md., 21st; Somerset, Mass., 24th; Northport, Mich., 28th; Flushing, N. Y., 4th. *Blue jays*, Guttenburg, Iowa, 27th; Muscatine, Iowa, 25th; Oregon, Mo., 5th. *Red Birds*, Orgeon, Mo., 5th; Brookhaven, Miss., 25th. *Owls*, Oregon, Mo., 10th, 11th, 15th, 16th. *Mocking Birds*, Houston, Tex., 14th; Independence, Kan., 17th; Savannah, Ill., 24th. *Prairie Chickens*, Hermepin, Ill., 28th; Monticello, Iowa, 27th; Creswell, Kan., 27th.

MISCELLANEOUS.—*Frogs* piping at Judsonia, Ark., 15th; Milford, Del., 22nd; Guttenburg, Iowa, 20th; Baxter Springs, Kan., 5th and 6th; Creswell, Kan., 2nd and 21st; Stanley, Kan., 17th; Independence, Kan., 18th; Fallston, Md., 21st; Sandy Springs, Md., 21st; Fort Gibson, Ind. Ter., 13th; Fayette, Miss., 1st, 6th and 14th; Howard, Neb., 18th; Alto Vista, Va., 1st; Prospect Hill, Va., 8th. *Earth-worms*, Lawrence, Kan., 28th; Oregon, Mo., 23rd. *Bees*, Milford, Ind., 20th; Guttenburg, Iowa, 6th; Afton, Iowa, 26th; Savannah, 24th; Chambersburg, Pa., 27th. *Caterpillars*, Monticello, Iowa, 28th; Tioga, Pa., 27th. *Lizards*, Austin, Tenn., 13th. *Millers*, Ft. Madison, Iowa, 6th. *Butterflies*, Guttenburg, Iowa, 5th; Savannah, 24th; Fayette, Miss., 8th and 16th, *Moths*, Guttenburg, Iowa, 5th; Oregon, Nev., 25th and 26th. *Mosquitos*, Fort Madison, Iowa, 28th; Independence, Kan., 24th to 28th. *Grasshoppers*, Guttenburg, Iowa, plentiful, 26th; Boonsboro, Iowa, 7th.

*Polar Bands*.—7th, Ind.; 8th, Miss, Iowa, N. H.; 10th, Iowa; 12th, Va.; 13th, Iowa; 16th, Mo.; 17th, N. H.; 18th, Miss., Neb.; 19th, Ind.; 21st, Mo., Neb.; 26th, Vt.; 27th, Ind.; 28th, Ind, Neb., Va.

*Sunsets*.—The characteristics of the sky as indicative of fair or foul weather for the succeeding 24 hours, have been observed at all Signal Service stations. Reports from 107 stations show 2,942 observations to have been taken, of which 2,539, or 86.3 per cent., were followed by the expected weather. Fifty-three doubtful cases were reported.

*Prairie Fires*.—1st, Ind. Ty.; 2nd, Ind. Ty., Dak.; 3rd, Ind. Ty., Minn.; 4th, Minn., Kan.; 5th, Kan.; 6th, Dak., Minn.; 7th, Minn.; 8th, Minn.; 9th, Minn.; 10th, Minn.; 16th, Kan.; 17th, Kan.; 18th, Kan.; 19th, Kan.; 21st, Kan.; 22nd, Ind. Ty.; 23rd, Ind. Ty., Dak., Kan.; 24th, Dak., Kan.; 25th, Ind. Ty., Kan.; 26th, Ind. Ty., Dak., Iowa, Kan.; 27th, Ind. Ty., Tex., Dak., Kan.; 28th, Dak., Kan.

*Meteors*.—3rd, Westchester, Pa.; 4th, Monticello, Iowa, Woodstock, Md., Flatonia, Tex.; 5th, Mobile; 6th, Woodstock, Md., Westerville, Ohio; 7th, St. Mary's Home, Ind., Somerset, Mass.; 9th, Ft. Pembina, Dak.; 12th, Fall River, Mass., Dunbarton, N. H.; 15th, Chepachet, R. I.; 16th, Chepachet, R. I.; 18th, St. Mary's Home, Ind., 12st, Flatonia, Tex.; 22nd, New Orleans; 24th, Kensico, N. Y.; 25th, Woodstock, Md., Kensico, N. Y., Mt. Auburn, Ohio; 26th, Woodstock, Md.; 27th, Corning, Mo., Freehold, N. J.; 28th, Woodstock, Md., Freehold, N. J.; 19th, Cincinnati, 10:15 p. m., a meteor shot through the clouds and moved from SW. to NE. It was very luminous, and small particles continually fell from it.

*Zodiacal Lights*.—Southington, Conn., 3d, 4th, 5th, 26th to 28th; Daytona, Fla., 1st, 4th, 19th to 26th; Como, Ill., 2nd; St. Mary's Home, Ind., 3d, 7th, 18th, 26th to 28th; Iowa City, Iowa, 1st to 4th, 19th, 27th, 28th; Monticello, Iowa, 1st, 2nd, 4th, 22nd to 26th; Great Bend, Kans., 25th; Okaloosa, La., 18th; Cornish, Me., 5th, 19th, 20th; Somerset, Mass., 2nd, 3d, 4th, 5th, 18th, 19th, 24th to 28th; Cambridge, Mass., 2nd to 5th, 18th to 19th, 24th to 28th; Corning, Mo., 23d to 27th; Oregon, Mo., 2nd, 21st to 23d, 25th to 28th; Clear Creek, Neb., 2nd, 19th, 21st, 23d, 25th, 26th; Freehold, N. J., 26th to 28th; Atco, N. J., 3d, 4th, 5th, 26th to 28th; Moriches, N. Y., 25th; Waterburg, N. Y., 4th, 18th; Bellefontaine, Ohio, 18th, 28th; Williamsport, Pa., 28th; Wytheville Va., 5th, 19th, 27th, 28th; Savannah, 1st; Tybee Island, Ga., 23d, 24th; Newburg, Vt., 2nd, 19th, 26th, 27th; Olivet, Dak., every night.

*Earthquakes*.—Records recently received from Coban, Guatemala, contain the following accounts: July 13th, 1877, 5:15 a. m., thirteen or fourteen shocks, direction E. to W.; 20th, 10:05 a. m., two slight shocks, E. to W.; 27th, 8 p. m., slight shock, lasting a few seconds. August 27th, 11:35 a. m., three shocks from N. to S.; September 10th, 10:45 a. m., two shocks, lasting seven seconds; the facade of church of San Sabastian swayed to and fro noticeably. November 21st, 10:16 a. m., two vertical shocks; 10:37 p. m., a number of small shocks, the first vertical, the last apparently from SW., duration forty seconds; 26th, 9:57 a. m., a few vertical shocks, repeating quickly, lasting twenty seconds. From Iquique, Peru, January 23d, 1878, 7:50 p. m., strong shock, lasting thirty seconds. "Shock appears to have been much greater in the interior, and many factories had to suspend work." Arica, Peru, January 23d, 8:10 p. m., "very severe and prolonged shock, followed by slighter shocks throughout night." Iquique, January 24th, 8:30 p. m., heavy shock,

followed by lighter shocks during night, and on the 25th, every fifteen minutes; "roads obstructed, and shipping operations paralyzed for three days." On the 5th of the present month, 11:20 a. m., Flushing, N. Y., severe shock, shaking houses and breaking crockery and windows. 26th, 11:56 a. m., San Francisco, California, three vibrations, N. to S., lasting about five seconds.

*Tidal Wave.*—At Callao, Peru, S. A., Jan. 27th, "sea excessively rough all day, the waves washed with violence along the whole sea front of town and for about two miles on either side, causing great destruction of property; flooded whole of English railroad station and streets adjoining; wet dock badly damaged; all forts fronting on sea suffered; the Ayacucho battery nearly washed away."

## SOLAR PHENOMENA.

*Sun spots.*—The following observations, made by Mr. D. P. Todd, have been communicated by Rear Admiral John Rogers, U. S. N., Superintendent of the Naval Observatory.

Feb., 1878.	No. of new—		Disappeared by solar rotation.		Reappeared by solar rotation.		Total number visible.		Remarks.
	Groups	Spots.	Groups	Spots.	Groups	Spots.	Groups	Spots.	
3d, 3 p. m...	2	14	0	0	—	—	2	14	Many of the spots very small. Many of the spots very small. Many of the spots very small. Most of the spots small. Spots probably disappeared by solar rotation.
4th, 11 a. m...	0	12	0	0	0	0	2	26	
5th, 10 a. m...	0	4	0	0	0	0	2	30	
6th, 2 p. m...	0	5	0	0	0	0	2	35	
7th, 3 p. m...	0	0	0	10	0	0	2	25	
12th, 1 p. m...	0	0	—	—	0	0	0	0	
16th, 12 m...	0	0	0	0	0	0	0	0	
18th, 1 p. m...	1	0	0	0	0	0	0	0	
19th, 12 m...	0	0	0	0	0	0	0	0	
20th, 12 m...	0	0	0	0	0	0	0	0	
25th, 3 p. m...	0	0	0	0	0	0	0	0	Large group of faculae. Large group of faculae.
26th, 3 p. m...	0	0	0	0	0	0	0	0	
27th, 11 a. m...	0	0	0	0	0	0	0	0	
28th, 11 a. m...	0	0	0	0	0	0	0	0	

Prof. Hinrichs, of Iowa City, reports on the 3rd, 1 group, 7 spots, two very large size; 4th, 2 groups, 12 spots; 5th, 2 groups, 12 spots; 6th, 2 groups, 9 spots; on the other days of observation, viz: the 11th, 12th, 19th, 26th 27th and 28th, no spots were observed.

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*Albert J. Myer*

Copy furnished for

*Brig. Gen. (Bvt. Assg<sup>d</sup>.) Chief Signal Officer, U. S. A.*